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Notes on the false scorpion genus *Solinus* in the Caucasus (Pseudoscorpionida: Olpiidae)

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Notes on the false scorpion genus *Solinus* in the Caucasus (Pseudoscorpionida: Olpiidae). - A larger series of *Solinus* material from Azerbaijan, Caucasus, allows not only a provisional identification of the Caucasian samples to be made as obviously belonging to *S. cyrenaicus* (Beier, 1929), but also to suggest that both *S. hispanus* Beier, 1939, and *S. rhodius* Beier, 1966, may prove to actually represent only junior synonyms of *S. cyrenaicus*. Though left here without formal synonyms pending a revision of type materials, this obviously trans-Mediterranean species seems disjunct enough to warrant erection of a separate olpiid genus different from *Solinus* s. str. An appeal is made to accomplish such a generic revision.

Key-words: Taxonomy - Pseudoscorpionida - Olpiidae - *Solinus* - redescriptions - Rhodes - Caucasus.

INTRODUCTION

The false scorpion genus *Solinus* Chamberlin, 1930, was originally established for two species: *Garypinus corticolus* Chamberlin, 1923 (the type-species), from Mexico, and *Garypinus australiensis* Chamberlin, 1930, from Australia. It is easy to note that both areas in question are extremely remote from the Mediterranean, a region where a whole number of *Solinus* species have since been described.

The following generic diagnosis was originally provided: "Arolium bifurcate, basal seta of chelicera present, palm of the chelicera with 5 or 4 (?) setae, tergites and sternites completely divided, femoral articulation of leg-I immobile and subvertical, patella of leg-I distincly longer than femur, tactile setae *t* and *st* of chelal movable fingers absent, *ib* closely grouped with basal groups of trichobothries of the chelal finger, *est* present, lamina exterior absent, metatarsus-IV and tibia-IV with a well-developed basal tactile setae" (Chamberlin 1930). To its author the genus seemed to be especially closely related to the genus *Aldabrinus* Chamberlin, 1930 from Aldabra Island, Seycheles.

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Solinus has first become recorded in the Caucasus quite recently due to the discovery of a closer unidentified species in Azerbaijan (Dashdamirov & Schawaller 1992). The geographically closest congeners refer to the Mediterranea (Fig. 12): *Solinus cyrenaicus* (Beier, 1929), *Solinus hispanus* Beier, 1939 and *Solinus rhodius* Beier, 1966.

A closer examination of the Azerbaijan specimens of Solinus (Dashdamirov & Schawaller 1992) coupled with a study of available comparative material from Greece have revealed that the Caucasian samples seem to actually belong to *Solinus cyrenaicus* (Beier, 1929), a species hitherto known solely from the type locality in Libya.

Beier's (1929) original description of *S. cyrenaicus* is presently quite inadequate for a safe identification of the species, many characters currently employed being omitted. Hence its full redescription as based on fresh material is given here. Besides, a redescription is provided of *S. rhodius* as based on topotypes.

Both measurements and terminology here accepted are those after Chamberlin (1932) and Harvey (1992).

Material. The specimens which this paper is based upon have been taken mostly by the author while a member of the Azerbaijan Academy of Sciences Expeditions to the Turianchay State Reserve during the spring and autumn of 1992–1994 (see Fig. 12). Besides, the *Solinus* material from the Staatliches Museum für Naturkunde in Stuttgart has been restudied for comparative purposes as well. The Caucasian specimens have been shared between the collections of the Institute of Zoology, Baku (IZB), Zoological Museum of the Moscow State University (ZMUM), Muséum d'histoire naturelle de Genève (MHNG), and Staatliches Museum für Naturkunde in Stuttgart (SMNS).

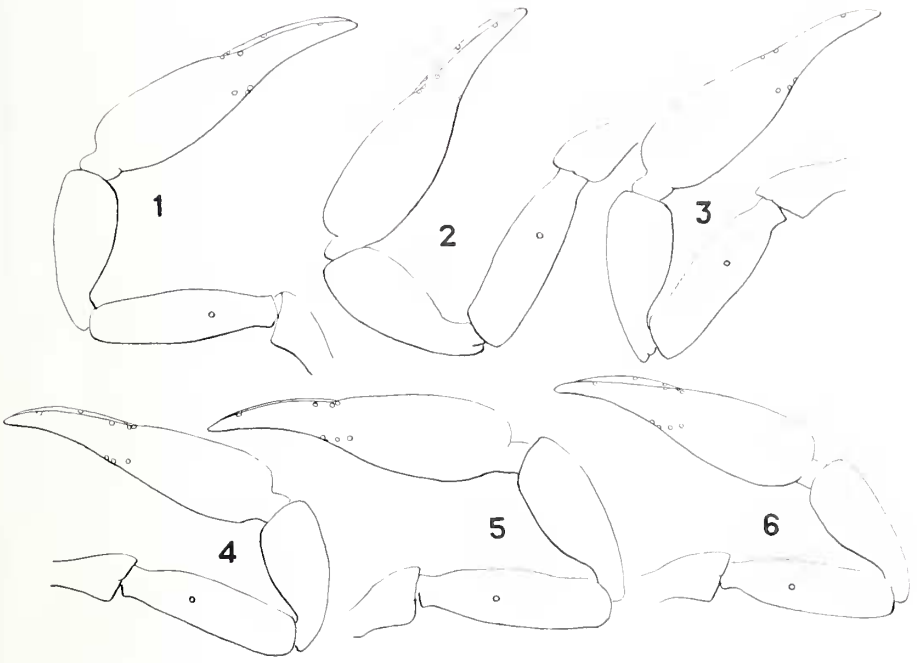
REDESCRIPTIONS

Solinus cyrenaicus (Beier, 1929) (Figs 1, 2, 4, 5, 7, 9, 11)

Material examined: Azerbaijan, Agdash Distr., Turianchay State Reserve, under bark of *Pistacia mutica*, 400–600 m, 8.V.1992, 30.IX.1994, leg S. Dashdamirov & H. Aliev, 19 males, 12 females, 4 TT (IZB No. 310, IZB No. 311]; 1 male, 1 female (ZMUM); 1 male, 1 female (SMNS); 1 male, 1 female (MNHG).

Description: Male. Carapace and tergites reddish-brown, pedipalps reddish, remaining parts lighter. Sclerotized part of carapace 1.61 times as long as wide, cucullus short and broad. All four eyes well-developed.

Tergal chaetotaxy 4–4–4–4–4–6–6–6–6–10 (6 + 4 tactile setae) –8 (4 + 4 tactile setae). Palm of chelicera with five setae, movable finger with one seta. Galea with three short terminal branches. Serrula with 15 lamellae. Flagellum with four blades. Ventral aspect of internal structures of male genitalia as in Fig. 11. Male sterna VI–VIII in all three mediterranean species with a median pair of glandular (?) setae. Pedipalp trochanter 1.72–1.9 times as long as broad. Pedipalp femur with a long tactile seta dorsally (TS = 0.38–0.39), 3.36–3.45 times as long as broad; patella (tibia)



FIGS 1–6

Pedipalps, dorsal view: 1, 2 – *Solinus cyrenaicus* (Beier, 1929), females from Turianchay (IZB 310, 311); 3 – *Solinus rhodius* Beier, 1966, female from Rhodes (SMNS 321); 4, 5 – *Solinus cyrenaicus* (Beier, 1929), male from Turianchay (IZB 310, 311); 6 – *Solinus rhodius* Beier, 1966, male from Rhodes (SMNS 321). – Scale bar: 0.5 mm.

2.38–2.57 times as long as broad; chela with pedicel 3.82–4.43 times, without pedicel 3.59–4.21 times as long as broad. Fixed finger with 17 teeth, movable finger with 20 teeth. Venomous tooth well-developed in both fingers, venom ducts short. Trichobothriotaxy typical for the genus. Leg IV: femur 2.54 times, tibia without tactile seta 3.14 times, basitarsus 1.2 times, and telotarsus 2.25 times as long as broad. Basitarsus with 1 tactile seta (TS = 0.33).

Measurements (in mm): Carapace 0.50–0.53/0.31–0.33. Pedipalp: trochanter 0.19/0.10–0.11; femur 0.37–0.38/0.11; patella (tibia) 0.31–0.36/0.13–0.14; chela with pedicel 0.62–0.65/0.14–0.17; length of chela without pedicel 0.59–0.61; length of finger 0.27–0.28. Leg IV: femur + patella 0.33/0.13; tibia 0.22/0.07; basitarsus 0.06/0.05; telotarsus 0.09/0.04.

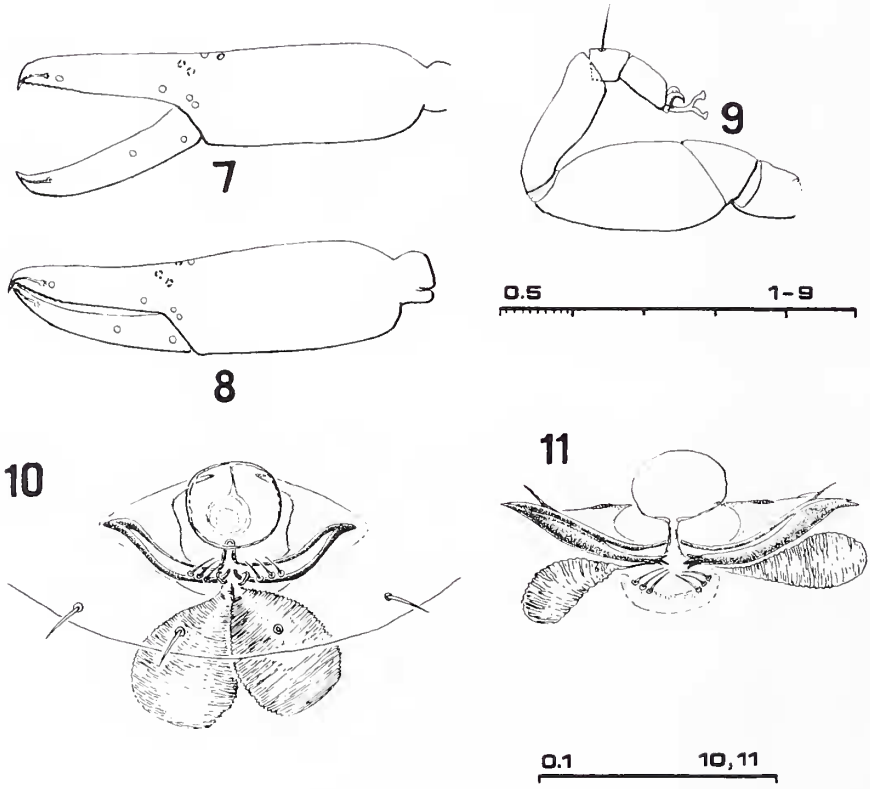
Female. Sclerotized part of carapace 1.62–1.7 times as long as wide. Tergal chaetotaxy: 4–4–4–4–4–6–6–6–6–10 (6 + 4 tactile setae) –8 (4 + 4 tactile setae). Pedipalp trochanter 1.82–2.11 times as long as broad. Pedipalp femur with a long

tactile seta dorsally (TS = 0.36–0.37), 3.17–4 times as long as broad; patella (tibia) 2.4–2.46 times as long as broad; chela with pedicel 3.76–3.88 times, without pedicel 3.56–3.59 times as long as broad.

Measurements (in mm): Carapace 0.47–0.51/0.29–0.30. Pedipalp: trochanter 0.19–0.20/0.09–0.11; femur 0.36–0.38/0.09–0.12; patella (tibia) 0.32–0.36/0.13–0.15; chela with pedicel 0.62–0.64/0.16–0.17; length of chela without pedicel 0.57–0.61; length of finger 0.25–0.27.

Solinus rhodius Beier, 1966 (Figs 3, 6, 8, 10)

Material examined: Greece, Rhodes Island, Kamiros, under bark of *Olea europaea*, 10.IV.1980, leg. W. Schawaller, 2 males, 3 females + prep. (SMNS 321).



Figs 7–11

7–8 Chela, lateral view: 7 - *Solinus cyrenaicus* (Beier, 1929), male from Turianchay (IZB 310); 8 - *Solinus rhodius* Beier, 1966, male from Rhodes (SMNS 321). - Scale bar: 0.5 mm. 9 - Lateral view leg-IV of *Solinus cyrenaicus* (Beier, 1929), male from Turianchay (IZB 310). - Scale bar: 0.5 mm. 10–11. Ventral aspect of internal structures of male genitalia: 10 - *Solinus rhodius* Beier, 1966, from Rhodes (SMNS 321); 11 - *Solinus cyrenaicus* (Beier, 1929), from Turianchay (IZB 310). Scale bar: 0.1 mm.

Description: Male. Carapace and tergites yellowish-brown, pedipalps brown, remaining parts lighter. Sclerotized part of carapace 1.63 times as long as wide, cucullus short and broad. All four eyes well-developed. Tergal chaetotaxy: 4–4–4–4–4–6–6–6–6–10 (6 + 4 tactile setae) –8 (4 + 4 tactile setae). Palm of chelicera with five setae, movable finger with one seta. Galea with three short terminal branches. Serrula with 15 lamellae. Flagellum with four blades. Ventral aspect of internal structures of male genitalia as Fig. 10. Pedipalp trochanter twice as long as broad. Pedipalp femur with a long tactile seta dorsally (TS = 0.39), 3.6 times as long as broad; patella (tibia) 2.46 times as long as broad; chela with pedicel 3.93 times, without pedicel 3.67 times as long as broad. Fixed finger with 16 teeth, movable finger with 17 teeth.

Measurements (in mm): Carapace 0.49/0.30. Pedipalp: trochanter 0.20/0.10; femur 0.36/0.10; patella (tibia) 0.32/0.10; chela with pedicel 0.59/0.15; length of chela without pedicel 0.55; length of finger 0.25.

Female. Sclerotized part of carapace 1.7 times as long as wide. Pedipalp trochanter twice as long as broad. Pedipalp femur with a long tactile seta dorsally (TS = 0.41), 3.08 times as long as broad; patella (tibia) 2.43 times as long as broad; chela with pedicel 3.88 times, without pedicel 3.63 times as long as broad.

Measurements (in mm): Carapace 0.51/0.30. Pedipalp: trochanter 0.22/0.11; femur 0.37/0.12; patella (tibia) 0.34/0.14; chela with pedicel 0.62/0.16; length of chela without pedicel 0.58; length of finger 0.27.

Remarks: *Solinus rhodius* was described by BEIER (1966) from a single specimen collected in Rhodes. Judged from the original description alone, the holotype clearly falls within the size variation range of *S. cyrenaicus*, and there seem to be no other characters which serve to separate the two species. Several topotypes of what I believe to be *S. rhodius* redescribed above seem to be also conspecific with *S. cyrenaicus*, with *S. rhodius* probably being nothing else but a junior synonym of *S. cyrenaicus*.

DISCUSSION

The above large *Solinus* series from the Caucasus makes it possible to provide some generalizations important enough for the systematics of the entire genus. Variations in some morphological structures have become especially apparent. This concerns mainly the size and proportions of the pedipalps, with all transitions between the extremes (cp. Figs 1–6). A scattergram (Fig. 13) shows the distribution of 38 individuals in relation to the ratios of the pedipalp femur and chela. The ratios of some other species are also plotted there as given in the literature. Three species, *S. cyrenaicus*, *S. hispanus*, and *S. rhodius*, except for the specimen of *S. cyrenaicus* quoted by BEIER (1932) and one female at hand from Turianchay, lie within a single cluster, this alone suggesting a single species, *S. cyrenaicus* Beier, 1929, by priority.

Originally, the separation of the above three Mediterranean species as given in the literature is based on the following characters: the femur length/width, patella (tibia) length/width and chela length/width ratios, the number of teeth of the chelal finger. Yet none of these characters appears to hold. At best we seem to face a transitional field between geographical subspecies of a single trans-Mediterranean

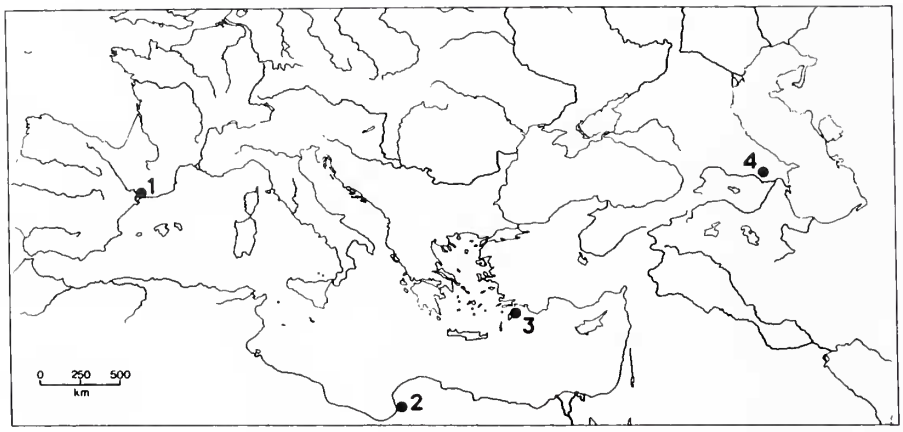


FIG. 12

Distribution of some *Solinus*: 1 - Tortosa, Spain (*Solinus hispanus*); 2 - Cyrenaica, Libya (*Solinus cyrenaicus*); 3 - Rhodes, Greece (*Solinus rhodius*); 4 - Turianchay, Azerbaijan (*Solinus cyrenaicus*).

species, with both *S. hispanus* and *S. rhodius* as highly probable synonyms of *S. cyrenaicus*. Yet I refrain from formally synonymizing anything prior to a revision of all type materials.

A side-by-side comparison or male genital structure of Rhodes and Turianchay samples corroborates with the above idea as well, for no evident characters serving for their separation could be revealed. Figs 10–11 show the same basic conformation, while the superficial disagreements are due solely to a somewhat different orientation.

Last but not least, it is noteworthy that there are some stable structural features of *Solinus*, such as the chaetotaxy of the chelicera and leg-IV (presence/absence and the size of tactile setae on the tibia and basitarsus), which have a taxonomic rank not lower than generic. From this standpoint, it seems more appropriate to eject some species from *Solinus s. str.* Perhaps a new, yet undescribed genus in the family Olpiidae is necessary to erect to embody some deviating members (including at least some Mediterranean species) of the currently evidently too commodious *Solinus*. To ultimately clarify the situation, a complete generic revision of *Solinus* is badly warranted. The present contribution is chiefly intended to pinpoint the still existing problems concerning olpiid systematics.

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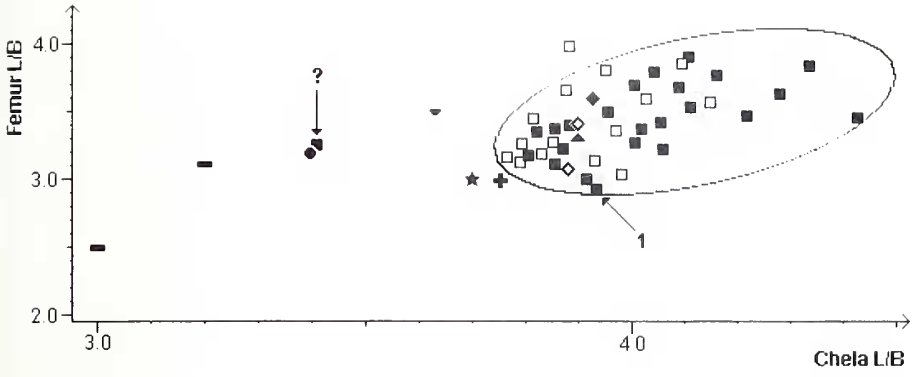

FIG. 13

Scattergram of proportions of pedipalp femur (Y) and chela (X) in some Solinus species. - Triangle: *S. hispanus*; Square: *S. cyrenaicus*; Asterisk: *S. africanus*; Semi-circle: *S. japonicus*; Circle: *S. australiensis*; Cross: *S. pusillus*; Rectangle: *S. corticolus*; Diamond: *S. rhodius*; 1: Holotype of *S. cyrenaicus* (after BEIER 1929); ?: *S. cyrenaicus* (after BEIER 1932). - Open symbols stand for females, full symbols for males.

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